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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/741,535	12/19/2000	Takashi Kumamoto	042390.P9482	6360

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EXAMINER

THAI, LUAN C

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 04/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/741,535

Applicant(s)

KUMAMOTO ET AL.

Examiner

Luan Thai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 February 2002.
- 2a) ☐ This action is **FINAL**.
- 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Election/Restrictions

1. Applicant's election *without traverse* of group II, claims 1-26 in Paper No. 3 is acknowledged.

Claims 27-30 have been canceled (paper No. 3).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 1-2, 4-10, 12-14, and 19, are rejected under 35 U.S.C. 102(e) as being anticipated by Chia et al. (6,081,997).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 1-2, 4-10, 12-14, and 19, (see figures 1-3, Col. 5, lines 30+, and col. 6-7) Chia et al. teach a method comprising: placing an incomplete flip chip package into a mold 20-26, the incomplete chip package comprising a chip 12 and a substrate 14 electrically coupled using a flip chip process (re-flowed solder bumps 16), the chip having a top surface facing the substrate, a bottom surface opposite the top surface, and one or more side surfaces between

the top and bottom surfaces; injecting under pressure (Col. 6, lines 25) a liquid resin comprised silica spheres (Col. 6, lines 40+) into mold, the resin encapsulating all the one or more side surfaces but the bottom surface of the chip, and filling a gap between the top surface and the adjacent substrate; and curing the resin, wherein the resin is cured by maintaining the resin at an elevated temperature for at least a predetermined period of time (Col. 6, lines 40+).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chia et al. (6,081,997) in combination with Baba et al. (6,071,755).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 3 and 17-18, the proposed method of Chia et al. teaches the claimed invention as detailed above except for the chip package comprising a passive component electrically coupled to the substrate.

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However, a semiconductor package comprising chip components and a passive component is conventional in semiconductor package art, as a package disclosed by Baba et al., from which a semiconductor package comprising chip components 31 and a passive component 53 (see figures 20-10-17, Col. 12, lines 35+) for the purpose of having a higher mounting density and a higher performance and function can be obtained, allowing a smaller electronic device to be realized (Col. 12, lines 41+). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a semiconductor package by the process as taught by Chia et al. including a passive component mounted on and electrically connected to the substrate, as taught by Baba et al., in order to have a higher mounting density and a higher performance and function can be obtained.

6. Claims 11, 15, 20-21 and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chia et al. (6,081,997) in view of Lin et al. (5,450,283).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claim 11, the proposed device of Chia et al. teaches all the limitations of the claimed invention as detailed above except for a release film intervened between the bottom surface of the chip and the upper mold cavity surface.

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Lin et al. while related to a similar package design teach (see specifically figures 3-4-5) a release film 38 intervened between the bottom surface 22 of the chip 18 and the upper mold cavity surface for the purpose of preventing flashing of the molding compound outside of the cavity 30 (Col. 4, lines 23+). It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Lin et al. teachings of the release film to the proposed device of Chia et al. in order to prevent flashing of the molding compound outside of the cavity.

Regarding claim 15, the proposed device of Chia et al. teaches all the limitations of the claimed invention as detailed above except for the substrate comprising a polymeric material.

Polymer is a conventional material in semiconductor art for making an insulating substrate, as taught by Lin et al. (Col. 3, line 27+). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use polymeric material for the substrate of Chia et al.'s device since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding claim 20, the proposed device of Chia et al. teaches all the limitations of the claimed invention as detailed above except for the bottom mold portion having a cavity.

Lin et al. while related to a similar package design teach (see specifically figures 3-4) bottom mold portion 36 having a cavity for holding the substrate 12. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Chia et al.'s bottom mold portion by forming a cavity in order to simplify the process of positioning the substrate on the bottom mold portion.

The further citations of claims 21 and 23-26 would have been obvious for the similar reasons set forth in the discussion of claims 1-20 above.

7. Claims 16 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chia et al. (6,081,997) in view of Lin et al. (5,450,283) and further in view of Glenn et al. (5,981,314).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 16 and 22, the proposed device of Chia et al. and Lin et al. teaches all the limitations of the claimed invention as detailed above except for the thickness the substrate (e.g., being an approximate thickness of 0.05 mm to 0.5 mm).

However, the substrate having the thickness in the claimed range is conventional in the art, as taught by Glenn et al. (Col. 4, lines 26+). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the substrate of the proposed device of Chia et al. and Lin et al.

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having the thickness in the range 0.05 mm to 0.5 mm since the substrate with such claimed thickness is conventionally used in semiconductor art.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan Thai whose telephone number is (703) 308-1211. The examiner can normally be reached on 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (703) 305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Luan Thai
March 28, 2002


DAVID L. TALBOTT
PRIMARY EXAMINER
ART UNIT ~~835~~
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